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The ventral nerve cord grows forward into the above mass as nerve fibers accompanied, probably, by some cells from the old cord. It is interesting to note here that the entire cord, at least as far back as the fifteenth segment, shows most active mitotic divisions of ganglion as well as of other cells. To this forward growth from the old cord is added a collection of many cells that migrate in, separately, from the new epidermis that grew over the cicatrix. These cells furnish the main part of the new brain.

The new epidermis over the cicatrix grows backward as a small funnel, which meets the old intestine as it elongates into the new tissue. The ingrowth ultimately opens into the old intestine and is thought probably to form the digestive tract in the new head as far back as the fourth segment, where the new pharynx will be formed from the old intestine.

The making of a new head in the earthworm thus involves elongation of old organs, transformation of some of them, and in the case of the nervous system marked change of activity even in parts remote from the wound; in addition there is a large element of new formation from cells of an embryonic and undifferentiated character.

E. A. A.

Two Papers on the Finer Structure of Nerve Cells. — Students of neurology are indebted to Prof. A. van Gehuchten for an excellent *résumé*¹ of the more recent work on the finer structure of the nervous cell. The paper was prepared as a report for the Twelfth International Congress of Medicine, held at Moscow in August, 1897. After a brief introduction the subject is dealt with in four chapters as follows: the internal organization of nervous cells, changes which accompany their different states of activity, changes from lesion of the axis-cylinder process, and changes from disturbances in the circulation and from poisons. The paper is illustrated by one plate, and the numerous bibliographical references are gratifying. It is to be regretted that the medical influence has asserted itself to such an extent that the report treats almost exclusively of the nervous cells of vertebrates.

Prof. C. F. W. McClure² has undertaken the study of the finer structure of the nerve cells in the invertebrates on lines inaugurated

¹ Gehuchten, A. van. *L'Anatomie fine de la cellule nerveuse. La Cellule*, tome xiii, pp. 313-390, 1897.

² McClure, C. F. W. *The Finer Structure of the Nerve Cells of Invertebrates. I. Gasteropods. Zool. Jahrb., Abt. f. Anat. u. Ontog.*, vol. xi, 1897.

for the vertebrates chiefly by Nissl, and gives in the first of what promises to be a series of contributions to this subject an account of the nerve cells of certain gastropods: *Helix*, *Arion*, and *Limax*. Exclusive of nuclei, the bodies of the nerve cells in these animals are composed of an apparently homogeneous ground substance containing many small granules usually arranged in rows. From the reactions of these granules to dyes, especially to methylene blue, they are regarded as similar to the chromophilous substance in the nerve cells of vertebrates. They are often grouped in spindle-shaped masses which resemble the "Körner" of vertebrate nerve cells. Fibrillæ, which differ in their staining qualities from the ground substance as well as from the granules, are believed to occur both in the bodies of the cells and in their axis-cylinder processes. In the majority of cells the fibrillæ show a concentric arrangement. The chromophilous granules form rows on or between these fibrillæ, but are not to be regarded as thickenings in the course of a fibrilla. In *Helix* it is interesting to note that structures comparable to centrosome and centrosphere have been identified. G. H. P.

Forestral Zoology. — Under the title *Forstliche Zoologie*,¹ Dr. Eckstein, Docent at the Forestry School of Eberswalde, publishes a manual of zoology as viewed from the standpoint of the student of forestry, in which not only the animals themselves, but the effects that they produce on plants are described and figured.

Zoological Notes. — The Report of the U. S. Commissioner of Fish and Fisheries for the year ending June 30, 1897, recently issued, contains as an appendix of 340 pages, with 80 plates, a comprehensive manual of fish culture, based on the methods of the United States Commission.

Dr. Ludwig Plate has described,² under the name *Macrophthalmia chilensis*, an interesting cyclostome. This form comes from fresh water, is about three feet in length, with compressed form; bluish black above, silvery white beneath. The most important structural features appear to be the large and well-developed eyes, much like those of teleosts, and the nasal opening not at the tip of a nasal papilla. There are seven gill openings; the teeth of the oral hood are simple and more like those of *Myxine* than those of *Petromyzon*. A full anatomical description is promised later.

¹ Eckstein, Karl. *Forstliche Zoologie*. Berlin, Parey, 1897. 8vo, viii + 664 pp., ff. 660.

² *Sitzungsberichte d. Gesellsch. f. Naturf.* Berlin, Freund, 1897.